



Figure 1. En face mount of rostellar hooks of *Taenia mustelae* from a cysticercus from a white-tailed prairie dog experimentally infected (Table 1) with eggs from a domestic ferret previously infected with cysticerci from a white-tailed prairie dog (Table 1). Phase contrast. Bar = 20 μ m.

hosts near Meeteetse, Wyoming, are *T. mustelae*. Recovery of *T. mustelae* from both the naturally and experimentally infected intermediate hosts (white-tailed prairie dog, white-footed mouse)

and definitive hosts (black-footed ferret, domestic ferret) demonstrates a viable pattern of transmission for this tapeworm. This report of *T. mustelae* in *M. nigripes* constitutes a new host record.

Voucher specimens of *T. mustelae* adults from *M. nigripes* (#80894) and *M. putorius* (#80893) and metacestodes from *C. leucurus* (experimental—#80890, natural—#80891) and *P. leucopus* (#80892) have been deposited in the USNM Helminthological Collection.

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Research Note

Helminths of *Semotilus atromaculatus* from Sugar Creek, McLean County, Illinois

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ABSTRACT: Creek chubs were collected from Sugar Creek, Normal, Illinois, between May 1984 and June 1987. Adult helminths recovered from 1,072 chubs included *Acanthocephalus dirus* (Van Cleave, 1931), *Allocreadium lobatum* (Wallin, 1909), and *Proteoceph-*

alus buplanensis (Mayes, 1976). Larval helminths recovered from chubs were *Posthodiplostomum minimum* (MacCallum, 1921), *Neascus* sp., *Diphyllobothrium* sp., *Archigetes* sp., and an unidentified nematode. *Posthodiplostomum minimum* exhibited the highest

Table 1. Prevalence and mean intensity of helminths found in 1,072 *Semotilus atromaculatus* from Sugar Creek.

Parasite	No. infected (prevalence)	Mean intensity ± 1 SE	No. worms recovered (range)	Location in host
Digenea				
<i>Allocreadium lobatum</i> *	336 (31.3)	2.8 ± 0.2	933 (1–26)	intestine
<i>Posthodiplostomum minimum</i> †	585 (54.6)	—	—	peritoneal cavity
<i>Neascus</i> sp.†	5 (0.4)	10.2 ± 8.7	51 (1–45)	integument
Cestoda				
<i>Proteocephalus buplanensis</i> *	18 (1.7)	1.3 ± 0.1	24 (1–2)	intestine
<i>Diphyllbothrium</i> sp.†	1 (0.1)	1.0	1	intestine
<i>Archigetes</i> sp.†	1 (0.1)	2.0	2	intestine
Acanthocephala				
<i>Acanthocephalus dirus</i> *	336 (31.3)	2.5 ± 0.2	839 (1–30)	intestine
Nematoda				
Species unknown†	3 (0.3)	1.0	3	peritoneal cavity

* Adult parasites.
† Larval parasites.

prevalence (54.6%), whereas both larval tapeworms exhibited the lowest prevalence (0.1%). *Neascus* sp. had the highest mean intensity (10.2). *Allocreadium lobatum* and *Acanthocephalus dirus* exhibited similar prevalences and mean intensities of infection.

KEY WORDS: *Semotilus atromaculatus*, creek chubs, *Acanthocephalus dirus*, *Allocreadium lobatum*, *Archigetes* sp., *Diphyllbothrium* sp., *Neascus* sp., *Posthodiplostomum minimum*, *Proteocephalus buplanensis*, Sugar Creek, Illinois.

The creek chub, *Semotilus atromaculatus* (Mitchill), is a common inhabitant of freshwater streams throughout North America east of the Rocky Mountains (Eddy and Underhill, 1978) and serves as host for numerous parasites (Hughes, 1928; Evans and Mackiewicz, 1958; DeGiusti, 1962; Hinson et al., 1976; Amin, 1977; Blouin et al., 1984). Reports on the population biology of *Acanthocephalus dirus* and *Allocreadium lobatum* in creek chubs from Sugar Creek, central Illinois, have been made by Camp and Huizinga (1980) and Camp (1989). However, these authors did not report the occurrence of other parasites in the chubs. The purpose of the present study was to survey the helminth parasites of creek chubs from Sugar Creek and to compare the findings with those of other studies.

The study site was a 0.8-km section of Sugar Creek, a small (2–4 m wide) and shallow (0.2–0.6 m deep) creek that flows through Fairview Park, Normal, Illinois. Creek chubs were sampled monthly from May 1984 through June 1987. Fish were collected with a 4- × 1.5-m minnow seine (mesh size 0.5 cm²) and transported alive

to the laboratory. In the laboratory, the intestine, peritoneal cavity, and skin of each creek chub were examined for parasites. Parasites found were processed by standard methods for microscopic examination.

Terminology follows the definitions of Margolis et al. (1982). Voucher specimens of the following parasites have been deposited in the USNM Helminthological Collection: *Allocreadium lobatum* (79281), *Acanthocephalus dirus* (79283), *Proteocephalus buplanensis* (80159), and *Posthodiplostomum minimum* (80160).

One thousand seventy-two (1,072) creek chubs were examined. The mean total length of the fish was 5.1 cm (range, 2.0–14.6 cm). Three adult and 5 larval helminth species representing 4 taxonomic groups were recovered from the fish (Table 1).

Allocreadium lobatum and *Acanthocephalus dirus* were found throughout the intestines of the chubs, and prevalences and mean intensities of infection for both parasites were similar (Table 1). No attempt was made to recover all the *Posthodiplostomum minimum* larvae because of the heavy infections often found in the fish.

The larval trematodes recovered from creek chubs in the current study have been commonly found in cyprinids by other investigators. Hughes (1928) found *Posthodiplostomum minimum* in creek chubs from a stream near Urbana, Illinois, and Amin (1977) recovered *P. minimum* from creek chubs from southeastern Wisconsin. Black-spot *Neascus* spp. previously found in creek chubs

include *Crassiphiala bulboglossa* (Hinson et al., 1976) and *Neascus pyriformis* (Blouin et al., 1984). Berra and Au (1978) reported that creek chubs from an Ohio stream were infected with *Uvulifer ambloplitis*. However, this report is suspect based on results reported by Hoffman and Putz (1965), who were unable to infect creek chubs experimentally with *U. ambloplitis*. Based on the results of Hoffman and Putz (1965) and personal communication with Dr. Hoffman, the *Neascus* sp. found in the current study is most likely *N. pyriformis*.

Posthodiplostomum minimum was the most prevalent parasite found in the chubs. This is not surprising because once recruited, the metacercariae are not lost and continued recruitment of these larvae would be expected. *Allocreadium lobatum*, the only adult trematode recovered in this study, was previously found in *Semotilus atromaculatus* from southern Michigan by DeGiusti (1962). DeGiusti did not report values for prevalence or mean intensity so no comparison can be made with the current study.

Camp and Huizinga (1980) reported the occurrence of *Acanthocephalus dirus* in creek chubs from Sugar Creek. They found lower prevalence (19.1%) and mean intensity (1.8) of infection than were seen in the current investigation. The higher values seen in the current investigation may have been caused by the higher prevalence of infection in the isopod intermediate host (59.5% vs. 32.0% found by Camp and Huizinga [1980]). It is not known why the isopods examined during the current study had a higher prevalence of infection.

Creek chubs infected with *Proteocephalus buplanensis* have been found in Nebraska (Mayes, 1976) and Wisconsin (Amin, 1977). The discovery of *P. buplanensis* in central Illinois extends its known geographic range. The recovery of a larval *Diphyllbothrium* sp. is unusual in cyprinids from the U.S. (Amin, pers. comm.), and it is not clear how the fish became infected with this parasite. The finding of immature *Archigetes* sp. is also unusual because these worms usually mature within their annelid hosts. The *Archigetes* sp. recovered were too immature to identify beyond the genus (Mackiewicz, pers. comm.).

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